abandoned which is a continuation-in-part of 07/451,507 filed December 15, 1989 issued as 5,135,516. The entire contents of each of these applications is hereby incorporated by reference.

Please replace the paragraph on page 4, lines 13-25, with the paragraph below

Rather than administering the hydrogel lining via a coating on a balloon, the catheter may include a delivery port for administering a hydrogel to the inner surfaces of the stent. For example, the balloon may include a first layer and a second outer apertured layer overlaying the delivery port. The hydrogel is administered through the outer apertured layer of the balloon to contact the inner surfaces of the stent to create a lining therein. After the hydrogel is applied to the stent, a crosslinking agent may be administered to contact the hydrogel. For example, an aginate hydrogel can be crosslinked by contacting it with calcium gluconate, and a hyaluronic acid hydrogel can be crosslinked by contacting it with divinyl glycol.

In the Claims

Please cancel originally filed claims 1-27 add the following claims 28-112.

28. A method for lining a stent, comprising:

(a) providing a catheter assembly comprising a balloon at least a portion of which is coated with a hydrogel, wherein an expandsible stent is mounted on said balloon in a contracted condition,

(b) introducing said assembly into a body lumen, and

(c) inflating said balloon to lodge said stent in said body lumen and to release said hydrogel from said coated portion to an inner surface of said stent as a lining.

29. The method of claim 28, wherein said body lumen is a blood vessel.

30. The method of claim 29, wherein said vessel is an occluded artery.

31. The method of claim 28 wherein said hydrogel is crosslinked.

32. The method of claim 28 wherein said hydrogel is selected from the group consisting of a polyacid, cellulosic polymer, collagen, gelatin, albumin, alginate, poly-2-hydroxyethyl methyl acrylate (HEMA), polyvinylpyrrolidone, maleic anhydride polymer, polyamide, polyacrylamide, polyvinyl alcohol, polyethylene glycol, polyethylene oxide, and polysaccharide.

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33. The method of claim 28 wherein said hydrogel is poly (arcylic acid).

34. The method of claim 28 wherein said poly (arcylic acid) is cross-linked.

35. The method of claim 28 wherein said hydrogel is hyaluronic acid.

36. The method of claim 35 wherein said hyaluronic acid is cross-linked.

37. The method of claim 28 wherein said hydrogel is derivatized albumin.

38. The method of claim 28 wherein said hydrogel an arcylic acid.

39. The method of claim 28 wherein said hydrogel is polyanhydride.

40. The method of claim 28 wherein said catheter further comprises a sheath for covering at least a portion of said balloon which is coated with said hydrogel.

41. The method of claim 40, comprising removing said sheath prior to inflating said balloon.

42. The method of claim 28 wherein said stent is a permeable stent.

43. The method of claim 28 wherein said hydrogel comprises a therapeutic agent.

44. The method of claim 43 wherein said therapeutic agent is an anti-thrombogenic agent.

45. The method of claim 44 wherein said anti-thrombogenic agent is selected from the group consisting of heparin, PPACK, enoxaprin, aspirin, and hirudin.

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46. The method of claim 43 wherein the therapeutic agent is a thrombolytic agent.

47. The method of claim 46 wherein the thrombolytic agent is selected from the group consisting of urokinase, streptokinase, and tissue plasminogen activator.

48. The method of claim 28 wherein said catheter comprises a plurality of delivery ports.

49. The method of claim 48, wherein said delivery port is located proximal to said balloon, upstream of said stent with respect to blood flow, such that hydrogel administered via said delivery port is carried by blood flow to said inner surface of said stent.

50. A method of lining a stent positioned in a body lumen, comprising:

(a) providing a catheter comprising a balloon at least a portion of which is coated with a hydrogel,

(b) introducing said catheter into said body lumen,

(c) advancing said catheter in said body lumen until said coated portion is positioned proximate to an inner surface of said stent; and

(d) inflating said balloon to release said hydrogel from said coated portion to said inner surface of said stent as a lining.

51. The method of claim 50, wherein said body lumen is a blood vessel.

52. The method of claim 51, wherein said vessel is an occluded artery.

53. The method of claim 50 wherein said hydrogel is crosslinked.

54. The method of claim 50 wherein said hydrogel is selected from the group consisting of a polyacid, cellulosic polymer, collagen, gelatin, albumin, alginate, poly-2-hydroxyethyl methyl acrylate (HEMA), polyvinylpyrrolidone, maleic anhydride polymer, polyamide, polyacrylamide, polyvinyl alcohol, polyethylene glycol, polyethylene oxide, and polysaccharide.

a3

55. The method of claim 50 wherein said hydrogel is poly (arcylic acid).

56. The method of claim 50 wherein said poly (arcylic acid) is cross-linked.

57. The method of claim 50 wherein said hydrogel is hyaluronic acid.

58. The method of claim 57 wherein said hyaluronic acid is cross-linked.

59. The method of claim 50 wherein said hydrogel is derivatized albumin.

60. The method of claim 50 wherein said hydrogel an arcylic acid.

61. The method of claim 50 wherein said hydrogel is polyanhydride.

62. The method of claim 50 wherein said catheter further comprises a sheath for covering at least a portion of said balloon which is coated with said hydrogel.

63. The method of claim 62, comprising removing said sheath prior to inflating said balloon.

64. The method of claim 50 wherein said stent is a permeable stent.

65. The method of claim 50 wherein said hydrogel comprises a therapeutic agent.

66. The method of claim 65 wherein said therapeutic agent is an anti-thrombogenic agent.

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67. The method of claim 66 wherein said anti-thrombogenic agent is selected from the group consisting of heparin, PPACK, enoxaprin, aspirin, and hirudin.

68. The method of claim 65 wherein the therapeutic agent is a thrombolytic agent.

69. The method of claim 68 wherein the thrombolytic agent is selected from the group consisting of urokinase, streptokinase, and tissue plasminogen activator.

70. The method of claim 50 wherein said catheter comprises a plurality of delivery ports.

71. The method of claim 70, wherein said delivery port is located proximal to said balloon, upstream of said stent with respect to blood flow, such that hydrogel administered via said delivery port is carried by blood flow to said inner surface of said stent.

72. A method of lining a stent positioned in a body lumen, comprising:

(a) providing a catheter comprising a balloon and a delivery port, wherein said balloon comprises a first layer and a second outer aperatured layer overlying said delivery port,

(b) introducing said catheter into said body lumen,

(c) advancing said catheter in said body lumen until said outer aperatured layer is positioned proximate to an inner surface of said stent;

(d) delivering a hydrogel into a space between said first layer and said

second outer aperatured layer, and

(e) inflating said balloon to press said hydrogel through said outer aperatured layer, wherein said hydrogel is deposited on said inner surface of said stent as a lining.

73. The method of claim 72, wherein said body lumen is a blood vessel.

74. The method of claim 73, wherein said vessel is an occluded artery.

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75. The method of claim 72 wherein said hydrogel is crosslinked.

76. The method of claim 72 wherein said hydrogel is selected from the group consisting of a polyacid, cellulosic polymer, collagen, gelatin, albumin, alginate, poly-2-hydroxyethyl methyl acrylate (HEMA), polyvinylpyrrolidone, maleic anhydride polymer, polyamide, polyacrylamide, polyvinyl alcohol, polyethylene glycol, polyethylene oxide, and polysaccharide.

77. The method of claim 72 wherein said hydrogel is poly (arcylic acid).

78. The method of claim 72 wherein said poly (arcylic acid) is cross-linked.

79. The method of claim 72 wherein said hydrogel is hyaluronic acid.

80. The method of claim 79 wherein said hyaluronic acid is cross-linked.

81. The method of claim 72 wherein said hydrogel is derivatized albumin.

82. The method of claim 72 wherein said hydrogel an arcylic acid.

83. The method of claim 72 wherein said hydrogel is polyanhydride.

84. The method of claim 72 wherein said catheter further comprises a sheath for covering at least a portion of said balloon which is coated with said hydrogel.

85. The method of claim 84, comprising removing said sheath prior to inflating said balloon.

86. The method of claim 72 wherein said stent is a permeable stent.

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87. The method of claim 72 wherein said hydrogel comprises a therapeutic agent.

88. The method of claim 87 wherein said therapeutic agent is an anti-thrombogenic agent.

89. The method of claim 88 wherein said anti-thrombogenic agent is selected from the group consisting of heparin, PPACK, enoxaprin, aspirin, and hirudin.

90. The method of claim 87 wherein the therapeutic agent is a thrombolytic agent.

91. The method of claim 90 wherein the thrombolytic agent is selected from the group consisting of urokinase, streptokinase, and tissue plasminogen activator.

92. The method of claim 72 wherein said catheter comprises a plurality of said delivery ports.

93. The method of claim 92, wherein said delivery port is located proximal to said balloon, upstream of said stent with respect to blood flow, such that hydrogel administered via said delivery port is carried by blood flow to said inner surface of said stent.

94. A method of selectively lining a permeable stent to treat an aneurism, comprising:

(a) providing a catheter comprising a balloon at least a portion of which is coated with a hydrogel,

(b) introducing said catheter into an aneurismal blood vessel comprising said permeable stent in the region of said aneurism,

(c) advancing said catheter in said vessel until said coated portion is positioned proximate to said aneurism; and

(d) inflating said balloon to release said hydrogel from said coated portion to an inner surface of said stent proximate to said aneurism to selectively line said stent, wherein said hydrogel renders said surface impermeable thereby reducing blood flow into said aneurism.

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95. The method of claim 94 wherein said hydrogel is crosslinked.

96. The method of claim 94 wherein said hydrogel is selected from the group consisting of a polyacid, cellulosic polymer, collagen, gelatin, albumin, alginate, poly-2-hydroxyethyl methyl acrylate (HEMA), polyvinylpyrrolidone, maleic anhydride polymer, polyamide, polyacrylamide, polyvinyl alcohol, polyethylene glycol, polyethylene oxide, and polysaccharide.

97. The method of claim 94 wherein said hydrogel is poly (arcylic acid).

98. The method of claim 97 wherein said poly (arcylic acid) is cross-linked.

99. The method of claim 94 wherein said hydrogel is hyaluronic acid.

100. The method of claim 99 wherein said hyaluronic acid is cross-linked.

101. The method of claim 94 wherein said hydrogel is derivatized albumin.

102. The method of claim 94 wherein said hydrogel an arcylic acid.

103. The method of claim 94 wherein said hydrogel is polyanhydride.

104. The method of claim 94 wherein said catheter further comprises a sheath for covering at least a portion of said balloon which is coated with said hydrogel.

105. The method of claim 104, comprising removing said sheath prior to inflating said balloon.

106. The method of claim 94 wherein said hydrogel comprises a therapeutic agent.

107. The method of claim 106 wherein said therapeutic agent is an anti-thrombogenic agent.

108. The method of claim 107 wherein said anti-thrombogenic agent is selected from the group consisting of heparin, PPACK, enoxaprin, aspirin, and hirudin.

109. The method of claim 106 wherein the therapeutic agent is a thrombolytic agent.

110. The method of claim 109 wherein the thrombolytic agent is selected from the group consisting of urokinase, streptokinase, and tissue plasminogen activator.

111. The method of claim 94 wherein said catheter comprises a plurality of delivery ports.

112. The method of claim 111, wherein said delivery port is located proximal to said balloon, upstream of said stent with respect to blood flow, such that hydrogel administered via said delivery port is carried by blood flow to said inner surface of said stent.